

SPECIAL PAPERS ON GENERAL METEOROLOGY.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

C. FITZHUGH TALMAN, Librarian.

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Anonymous publications are indicated by a _____.

Aichiken. Meteorological observatory.

Hailstorm that devastated the plane [sic] of Owari, April 19, 1912. [Japanese] [Nagoya. 1912.] 8°.
Rivers and floods. Water levels in relation to rainfall. [Japanese] [Nagoya. 1912.] 8°.

Allingham, William.

Weather signs and how to read them. For use at sea. Glasgow. 1912. vii, 117 p. 12°.

Australia. Commonwealth bureau of meteorology.

Rainfall map of Australia [and Tasmania] for the year 1911. [Melbourne. 1912.] 56 $\frac{1}{2}$ by 66 cm.
Results of rainfall observations made in Victoria during 1840 to 1910. Including all available . . . totals. [Compiled by Quayle and Hodge.] Melbourne. [1911?] xxxviii, 55 p. maps. f°.

Bahr, Heinrich.

Die interdiurne Veränderlichkeit des Luftdrucks. [Berlin.] 100 p. 8°. (Diss.—Berlin, 1910.)

Bavaria. K. Bayerisches hydrotechnisches Bureau.

Jahrbuch für 1911, Heft I—Niederschlagsbeobachtungen. München. [1912]. xii, 227 p. f°.

Belgium. Observatoire royal de Belgique.

Annuaire météorologique, 1912. Bruxelles. 1911. vi, 271 p. 12°.

British association for the advancement of science.

Report of the 80th meeting, Portsmouth, 1911. London. 1912. cxlviii, 804 p. 8°.

Buitenzorg. Institut botanique de l'Etat.

Observations météorologiques, année 1910. [Batavia.] f°.

Church, James E., jr., & Ferguson, S. P.

The avoidance and prevention of frost in the fruit belts of Nevada. Reno, Nev. 1912. 58 p. 16 pl. 8°. (Nevada agric. exper. sta. Bull. 79.)

Cohen, Julius B. & Ruston, Arthur G.

Smoke, a study of town air. London. 1912. vi, 88 p. 8°.

Denmark. Meteorologiske Institut.

Nautical-meteorological annual, 1911. Kjøbenhavn. 1912. 154 p. pl. f°.

Dreis, J.

Aus dem Reich der Wolken. Stuttgart. 1911. 121 p. 12°. (Deutsche Jugend- und Volksbibliothek, Band 231.)

Grenander, Sven.

Über das Erscheinen der Seebreeze an der schwedischen Ostküste. Uppsala. 1912. 97 p. pl. 8°. (Diss.—Uppsala?)

Hennig, Richard.

Die angebliche Kenntnis des Blitzableiters vor Franklin. Leipzig. 1909. 8°. (Reprint: Archiv, Geschichte Nat.-wiss. u. d. Technik, 1909, Bd. 2, p. 97-136.)

Hesse. Grossherzogl. hydrographisches Bureau.

Niederschlagsbeobachtungen, 1911. 11. Jahrgang. Darmstadt. 1912. 74 p. f°.

India. Meteorological department.

Memorandum on meteorological conditions prevailing before the advent of the SW. monsoon of 1912, by Gilbert T. Walker. Simla. 1912. 3 p. f°.

Greene, Laurenz.

Orchard heating. Ames, Ia. [1912.] 8°. (Iowa agricultural exper. sta. Bull. 129, p. 131-164.)

Jans, C. de.

Coup d'œil rétrospectif sur les essais d'explication de la foudre globulaire. Bruxelles. [1912]. 48 p. 8°. (Reprint: Ciel et terre, Bruxelles, 1910, 1911, 1912.)

Jochimsen, [C.]

Die Phänologie und die Klimakunde im Dienste des Obstbaus und der Landwirtschaft. [Reprint: Fühlings landwirtschaft. Zeitung, Stuttgart, 1. Jan. 1912, 61. Jahrgang, p. 26-32.]

Kretzer, Eduard.

Beziehungen zwischen dem täglichen Gang der Temperatur an der Bodenoberfläche und in den untersten Luftsichten. [Berlin. 1912.] 91 p. 4°. (Diss.—Berlin, 1912.)

Lindsay, George A.

The annual rainfall and temperature of the United States. (Read, June 5, 1911.) (From: Trans. ac. sci. of St. Louis, 1912, v. 21, No. 2, p. 71-78.)

Loisel, Julien.

Atlas photographique des nuages. Paris. [1911.] 4 p. 10 pl. f°.

Milan. R. Osservatorio astronomico di Brera.

Osservazioni meteorologiche e geofisiche, 1911. Milano. 1912. xi, 53 p. 4°.

Mohn, Henrik.

Hypsometret som Lufttryksmaaler. Kristiania. 1911. 10 p. 8°. (Vidensk. Forhdl., 1911. No. 2.)

Norton, Thomas H.

Utilization of atmospheric nitrogen. Washington. 1912. 178 p. 8°. (U. S. Bureau of manufactures. Special agent ser. No. 52.)

Norway. Norske meteorologiske Institut.

Aarsberetning for 1910/11. [Kristiania.] 1911. 12°. Jahrbuch, für 1911. Kristiania. 1912. xiv, 122 p. f°. Nedbørriagtageleser i Norge. Aargang 17, 1911. Kristiania. 1912. xii, 79, 75 p. f°. Oversigt over luftens Temperatur og Nedbøren i Norge i aaret 1910. [Kristiania.] [1911.] 21 p. 8°.

Radcliffe observatory.

Results of meteorological observations, 1906-1910. Oxford. 1912. xvi, 130 p. 4°.

Reed, William F., jr.

Climatology of Pensacola, Fla., [Pensacola. 1912.] 18 p. 4°. [Mimeographed.]

Southport. Fernley observatory.

Report and results of observations, 1911. Southport. 1912. 32 p. 8°.

Switzerland. Schweizerische meteorologische Central-Anstalt. Annalen, 1910. 47. Jhrg. Zürich. [1912?] var. pag. f°.
United States. National waterways commission.

Final report [with appendices.] Washington. 1912. 579 p. 8°. (62d Cong. 2d sess. Senate doc. 469.) [In appendix V, R. Zon discusses "Forest and water in the light of scientific investigation."]

RECENT PAPERS BEARING ON METEOROLOGY.

C. FITZHUGH TALMAN, Librarian.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers and other communications bearing on meteorology and cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled. It shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a _____.

American journal of science. New Haven. ser. 4. v. 84. July, 1912. W., H. L. The higher layers of the atmosphere. p. 88-90. [Abstract of paper by A. Wegener.]

Cairo scientific journal. Alexandria. v. 6. May, 1912.

Craig, J. L. Evaporation in Egypt and the Sudan. p. 103-107.

Country gentleman. Philadelphia. v. 77. July 6, 1912.

— The souring of milk by thunderstorms p. 10.

Electrical world. New York. v. 66. July 6, 1912.

Kellogg, E. W. Lightning conductors. p. 60. [Discusses advantages of different sized wires for conductors.]

- Engineering news.* New York. v. 67. 1912.
— The origin and composition of icebergs. p. 1225. (June 27.)
- Engineering news.* New York. v. 68. 1912.
— Wind pressure on inclined roofs. p. 66-68. (July 11.)
— The relation between wind velocities and pressures. p. 75-76. (July 11.)
- Geographical journal.* London. v. 45. July, 1912.
- Turley, Robert T.** Climatic and economic conditions of northern Manchuria. p. 57-59.
— Health of white men in the Philippines. p. 85. [Abstract of article in Philippine Journal of Science as to effects of tropical light. Negatives the opinion that brunettes are better adapted to the climate than blondes.]
- International institute of agriculture. Bureau of agricultural intelligence and of plant diseases. Bulletin.* Rome. 3d year. June, 1912.
- Talanoff, V.** Relation between rainfall and the maize crop in Russia. p. 1264-1266. [Abstract.]
- Eredia, Filippo.** Climatology of Tripoli and Benghazi (Climatologia di Tripoli e Bengasi). p. 1269-1271. [Abstract.]
- International institute of agriculture. Bureau of economic and social intelligence. Bulletin.* Rome. 3d year. May, 1912.
— Work of the hail insurance companies and mutual hail insurance societies [of France] in the last twenty years. p. 47-52.
- Nature.* London. v. 89. 1912.
- Barnes, Howard T.** Icebergs and their location in navigation. p. 411-414. (June 20.) [Abstract.]
— The drift ice of the great Newfoundland bank and its danger to navigation. p. 428. (June 27.)
- Popular science monthly.* New York. v. 81. July, 1912.
- Humphreys, W[illiam] J[jackson].** Holes in the air. p. 50-60.
- Scientific American.* New York. v. 106. June 29, 1912.
— The "electric Niagara" delusion in France. A new supposed method of preventing hail. p. 584.
- Talman, Charles Fitzhugh.** New ideas about lightning. A postscript to the schoolbooks and encyclopedias. p. 586-587.
- Scientific American supplement.* New York. v. 73. 1912.
- Alter, J. Cecil.** Predicting water supply for the farmer. Forecasting summer flow of streams from snow measurements in the mountains. p. 413-414. (June 29.)
- Talman, Charles Fitzhugh.** The elusive will-o'-the-wisp. One of nature's unsolved enigmas. p. 47-48. (July 20.)
- Zahn, A. F.** Elements of theoretical aeromechanics. p. 30-31; 37-38; 51. (July 13-27.)
- Symons's meteorological magazine.* v. 47. 1912.
— Abbott Lawrence Rotch. p. 92-93. (June.)
— Meteorological instruction for aviators. p. 93-94. (June.) [Meteorological features of the British scheme of military and naval aviation.]
- Henkel, F. W.** The aurora. p. 122-125. (July.)
- Academie des sciences. Comptes rendus.* Paris. Tome 154. 10 juin 1912.
- Guye, Ph. A, Kovacs, G., & Wourtzel, L.** Poids du litre normal d'air atmosphérique à Genève. p. 1584-1586.
- Vallot, J[oseph].** La grêle et le givre au Mont Blanc. p. 1650-1652.
- Chauveau, A. B.** Observations sur l'électricité atmosphérique pendant l'éclipse du 17 avril 1912. p. 1652-1654.
- Broglie, — de.** Sur l'éclipse du soleil du 17 avril et la radiation pénétrante mesurée par l'ionisation naturelle de l'air en vase clos. p. 1654-1655.
- Archives des sciences physiques et naturelles.* Genève. Tome 33. 15 juin 1912.
- Trillat, A.** Sur la théorie miasmatique et les idées du jour. p. 500-523.
- Cosmos.* Paris. 61 année. 27 juin 1912.
— Influence de l'aurore polaire sur les ondes électriques. p. 703-704.
- Nature.* Paris. 40 année. 18 juillet 1912.
- Loisel, J[ulien].** L'observation des nuages. p. 106-109. [Illustrated.]
- Observatoire royal de Belgique. Annuaire météorologique pour 1912. Bruxelles.*
— Le crépuscule météorologique d'après J. Kiessling. p. 19-23.
— La température à l'ombre et la température au soleil. p. 28-35.
— Les feux follets. p. 37-66.
— Observations de mistpoeffers. p. 67-79.
— Liste des meilleurs ouvrages de météorologie. p. 80-88.
- Vanderlinde, E.** Les orages en Belgique en 1911. p. 89-128.
- Vanderlinde, E.** Revue climatologique pour l'année 1911. p. 129-162.
— Le réseau climatologique. p. 163-176.
- Vanderlinde, E.** La grêle en Belgique pendant l'année 1911. p. 177-203.
- Obrervatoire royal de Belgique. Annuaire météorologique pour 1912. Bruxelles*—Continued.
- Vincent, E.** Ascensions de ballons-sondes en Belgique. p. 204-237.
— Notes bibliographiques sur les nuages (Classification et nomenclature). p. 262-271. [Calls attention to numerous faults and errors in the International Cloud Atlas.]
- Beiträge zur Geophysik.* Leipzig. 11. Band. 2/4. Heft. 1912.
- Wagner, Gottbold.** Die Änderung des Luftdruckes im anomalistischen Monat. p. 276-313.
- Wolff, Hans.** Beiträge zur Extinktion des Fixsternlichts in der Erdatmosphäre. p. 354-413.
- Förster, Gustav.** Beitrag zur Theorie der Seitenrefraktion. p. 414-469.
- Wegeher, Alfred.** Die Erforschung der obersten Atmosphärenschichten. p. kl. Mitt. 104-124.
- Wegeher, Kurt.** Das Aufsteigen der Luft über tätigen Vulkanen. p. kl. Mitt. 136-139.
- Sernander, Rutger.** Postglaziale Klimaschwankungen im skandinavischen Norden. p. kl. Mitt. 140-147.
- Meteorologische Zeitschrift.* Braunschweig. Band 29. Juni 1912.
- Johansson, Oscar V.** Über Wasserstands- und Klimaschwankungen in Nordeuropa nach Wallén u. a. p. 257-262.
- Defant, A.** Der tägliche Gang der Temperatur auf dem Obirgipfel (Hannwarte 2141 m.) p. 263-272.
- Kabos, Hegyofky.** Ein Beitrag zu den Wärmesummen in der Phänologie. p. 272-281.
- Richarz, F.** Über die das Brockengespenst umgebenden Beugungsringe. p. 282-285.
- Obermayer, Albert v.** Photographie der Glorie um den Ballon-schatten vom Ballon aus. p. 286-287.
- Peppler, Albert v.** Der vertikale Gang der Temperatur und Windgeschwindigkeit im tropischen und subtropischen Atlantischen Ozean. p. 288-290.
- Ficker, Heinrich v.** Beobachtung vertikaler Luftbewegung bei Ballonfahrten im Gebirge. p. 292-294.
- Diercke, H.** Über die Helligkeit des Himmels in der Nähe der Sonne. p. 294-296. [Abstract.]
- Corrigendum—*Monthly Weather Review.* v. 40, No. 4. p. 649, column 1, line 9. For "Advance of Agriculture. What science is doing for the farmer," read: "Mixing air to prevent frosts." p. 11. (May 18.)

MAMMATO-CUMULUS CLOUDS.

By W. J. HUMPHREYS, Professor of Meteorological Physics, U. S. Weather Bureau.

The accompanying illustrations, from photographs taken at Bartlesville, Okla., June 15, 1912, at 6.30 p. m., by Mr. Loran C. Twyford, show an admirable example of that unusual cloud formation commonly known as the mammato-cumulus.

Mr. Twyford writes that possibly 45 minutes before the clouds were seen a cyclone did great damage about 20 miles away, and in the direction from which the clouds came. Similar clouds were observed by Prof. H. C. Frankenfield¹ at St. Louis in connection with and just preceding the tornado of May 27, 1896, that did such damage in that city. They have also been noted occasionally by many other observers and in various parts of the world but usually in the neighborhood of tornadoes, squalls, or other violent atmospheric disturbances.

Osthoff² in his report on 67 occurrences of the mammato-cumulus which he observed during the course of 21 years, 1885-1905, says that they are tenfold more frequent during summer than in winter, and nearly as many fold more frequent of afternoons than of mornings. He also finds that this particular formation occurs at various levels and especially as a modification of the strato-cumulus and other sheet clouds.

Presumably, then, the formation of mammato-cumuli is dependent upon certain unusual conditions incident to hot weather and that are often productive of severe local storms. Just exactly how they are formed, however, is not certain, but apparently they are due to local down

¹ Monthly Weather Review, vol. 24, p. 77, 1896.
² Met. Zeit., vol. 23, p. 401, 1906.